

Computer Graphics – Assignment 5

Hierarchical Models and Animation



In this project you get the opportunity to draw and animate Luxo Jr. Your program should have the following functionality:

1. Include a menu that appears when the right mouse button is clicked (refer to section 3.7 in the textbook, or source code `shapes3D.cpp` on the class website). The menu should allow you to select any one of Luxo's rotational joints. (similar to the robot menu we saw in class, which enabled us to select the upper arm joint, lower arm joint, upper leg joint, etc...) Once a joint is selected, pressing the up and down arrow keys should increase and decrease the rotation at this joint, and the display should be redrawn after each key press.
2. Add to your menu the option of starting one or more animations of Luxo. Selecting one of these menu options should begin a short animation showing Luxo moving in some fashion. This is done by varying Luxo's position or joint angles over time. This will involve repeatedly setting the timer callback to go off every X milliseconds. Each time it goes off, the value of Luxo's joint angles and/or position should be adjusted appropriately by a small amount, the display redrawn, and then a new timer callback set.

You will be graded on several things including:

- 1) How creatively you model Luxo.
- 2) Good code organization. Split your code into multiple modules – say, `Luxo.cpp` and `Luxo.h`, plus a driver file that contains the callback and main functions.
- 3) Use of the three-step algorithm for drawing hierarchical models.
- 4) Good use of the Modelview matrix.
- 5) Good use of the timer, menu, and special arrow key callback functions.
- 6) How creative your animation(s) are and/or how nice the motion is. For example, a motion that is random is not as desirable as a motion that has meaning or expression.

Hand-in instructions:

At the beginning of your code, write a clear description of what the program does. Insert explanatory comments throughout your code. Email your source code to your instructor, and a readme file explaining the amount of time spent on this project, any known bugs, and any suggestions for improvement to the assignment.